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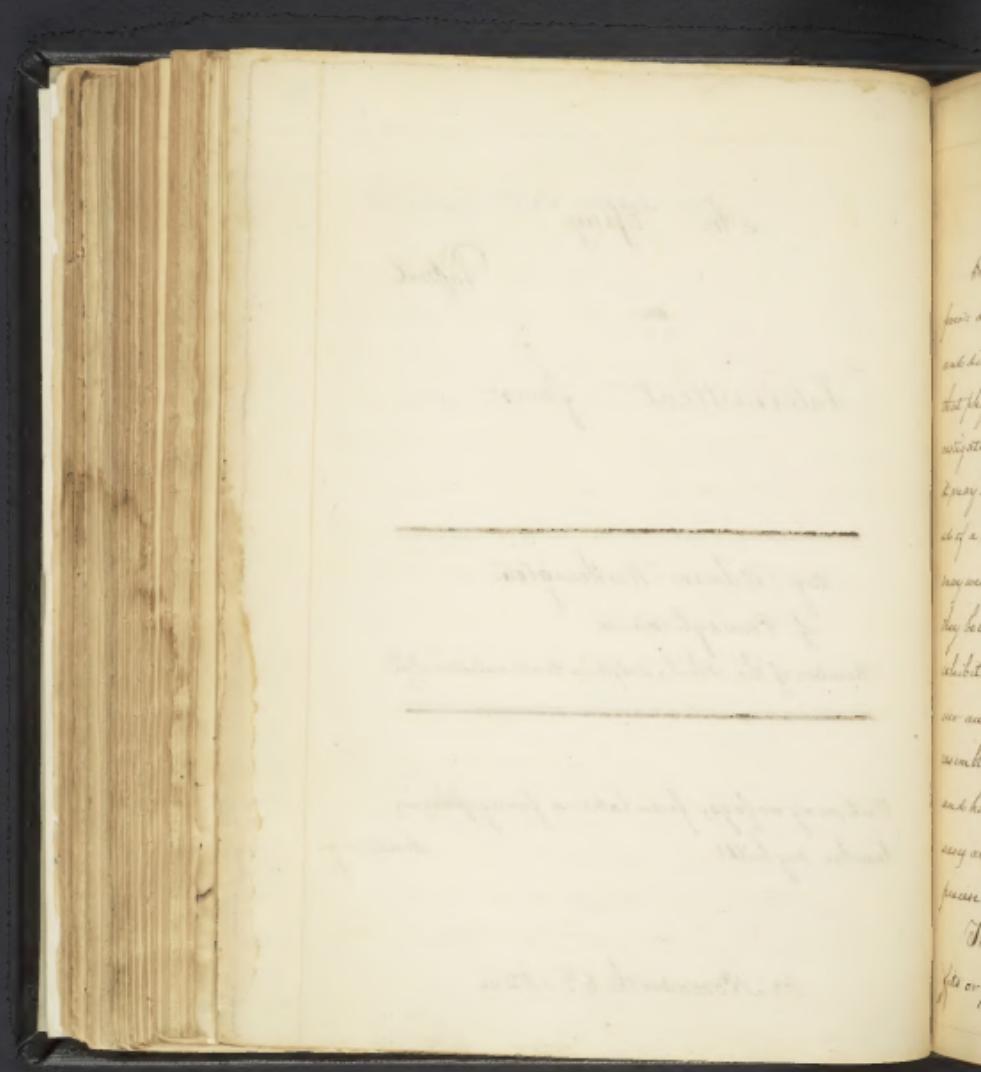
An Essay
on
Intermittent fever

by Wilmer Worthington
of Pennsylvania
Member of the Philadelphia medical society.

But may no foggs, from lake a feany plain,
Involve my hilt!

Armstrong.

On November the 6th 1824.



1 Intermittent fever.

In the following dissertation, I propose to treat of Intermittent fever: and from its wide prevailing nature, frequent occurrence, and dilatory progress towards mortality; we may properly suppose that physicians have not been indolent in exploring its nature, investigating its cause, and endeavouring to find out a remedy by which it may be uniformly cured. The disease itself, cannot be considered of a very dangerous character, yet others of a more serious nature may wear its livery, and excite little or no apprehension, until they become developed from under the intermittent gauze, when they exhibit the most malignant and alarming aspects. Many of our autumnal fevers are ushered in with symptoms so strongly resembling ague, that fatal mistakes are occasionally met with, and hence we see the necessity of seriously deliberating what disease are prevalent, and forbearing to apply our tonics, until the precise character of the disease is ascertained.

The disease called an Intermittent fever, occurs in distinct fits or paroxysms, with an interval of health, or a complete subsidence.

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silence of the febrile symptoms between them. It is also called a double tertian, from the shivering which commences the fit; and they have received different names, according to the length of time intervening between each paroxysm. Thus when the fit recurs every day, or there is an interval of twenty four ^{hours}, it is called a quotidian; when every other day, or there is an interval of forty eight hours, it is called a tertian; when every fourth day, or there is an interval of twenty two hours, it is called a quartan. Of each of these nosologists have made a great many subdivisions, and also have added, many others of longer intervals. And although we cannot doubt the existence of such cases, I am inclined to believe their occurrence is extremely rare, and a knowledge of them can be of no real service. I shall however, to make my day more complete, and adhere to the custom of former writers, introduce those which are said most frequently to occur.

That which is called a double tertian, is described as having a paroxysm every day, with the alternate paroxysms alike. Also, the double tertian, with two paroxysms every other day. The triple tertian, with two paroxysms on one day, and once the

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the next. The double quartan, with two paroxysms on the first day, none on the second and third, and two again on the fourth. The triple quartan, with a paroxysm on the first day, another on the second, but none on the third. The triple quartan, with three paroxysms every fourth day. The triple quartan, with a paroxysm every day, every fourth day, being similar.

The paroxysms of these different types have been observed to occur at particular hours of the day; as the quotidian in the morning, the tertian at noon, and the quartan in the evening. And to the generality of cases this observation may be correctly applied; yet it is by no means an inviolable rule, for we find them coming on at all hours during the day, but much less frequently in the night.

As to the most common form of these agues, there is some difference of opinion. Cullen, no doubt as he observes, found in his practice the quartan to be the most frequent in its occurrence; but he seems to have had the best informed practice of Europe as well as this country against him. Those of the latter say with confidence, that the tertian is the most common form, and the

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easiest of cure; while the quartan is least, so in both these respects, and ensuing only from protracted or neglected tortions. Among those who are of this opinion, are ranked Professors Chapman and Caldwell, than whom, no higher authority could be adduced.

The course which an intermittent fever generally runs, is so well known, that to describe it, is but to repeat what has been already said by writers, who have so minutely enumerated the symptoms, that nothing new can be added. A paroxysm of this disease then, consists in a cold, a hot, and sweating stage, each of which has its distinct symptoms.

The cold stage is preceded by languor and a sense of debility, a sluggishness of motion, and some uneasiness in exerting it, with a disagreeable kind of yawning, and an irresistible propensity to stretch the limbs. At the same time there is some little nausea, the nails turn to a bluish purple, the face becomes pale, the features shrink, the skin is contracted, and communicated the sensation of cold to the hand, particularly when applied to the extremities. These symptoms are soon succeeded by rigors, pains in the head, loins, and extremities; the respiration is small, frequent, and sometimes

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times intermission; the pulse becomes smaller, less frequent, & often irregular; the urine is almost limpid, and destitute of sediment; the bowels continue in motion, and the patient is often comelose & melancholy as well as fatigued; in some cases it has a tendency to convulsions. After these symptoms have continued two or three days the vapors become violent, and are alternated with convulsions of heat, which spread over the whole body, and increase in violence as the patient continues to abate. The face is now flushed, the temples throbbing, there is pain in the head, back, and some of the seat joints; there is an anxiety, restlessness, and a tendency to delirium. The pulse becomes more regular, hard, and voluminous, the respiration anxious, and the urine is rich colored, but still without sediment. The skin is relaxed, smooth, and dry during the continuance of this protracted violent heat; and the face and other parts of the body not only recover their usual size, but even beat marks of distinction. After this violent heat, and torpor have continued for some time, a slight moisture breaks out upon the forehead, which gradually increases over the whole body; and at last protracting the vapors, the heat and thirst abates, the body returns to its natural

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natural temperature, the urine deposit a latencies sediment, and most of the functions are restored to their ordinary condition.

These are the most important symptoms constituting a regular paroxysm of intermittent fever; but in some authors we find others mentioned, which it is unnecessary to enter. We will speak of these. There are also some anomalies to be met with, and it will be right to notice particularly as this has been handed to us by the highest authorities. Cawcavon in L. L. has mentioned cases in which the cold stage was entirely wanting; the same has been observed by some authors of the hot stage; and also, in some cases the hot is rapidly succeeded by the cold; and it is stated, by Jackson that cases occurred to him in which the heat was wanting off by urine and stool, without the least degree of moisture on the skin. There is also another irregularity in an attack of this fever which I am to mention; and that is, its being sometimes located in a particular part of the body only, as in one of the limbs, and passing through all the different stages of a paroxysm. Professor Chapman says he has known it seated in the eye, which a few days before was attacked with pain. Such would give the ill-

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subside. ... as was owned by the same physician. He also relates the case of a lady who every other day was attacked by a severe pain in the lower part of the abdomen. As she came from a miasmatic country, and had been subject to intermittent fever, he was led to suppose that the periodical return of pain depended on some disposition of the constitution for this disease. Such a resolution was directed until she recovered.

As to the cause of intermittent fever there seems to be no kind of doubt. There is no fear of any, but what are fully satisfied that its origin is dependent on marsh miasmatia, which opinion was first promulgated early in the last century by Lancisi, an Italian writer, and has since been confirmed by all writers on this subject, and is now received as one of the best established points in medicine.

Notwithstanding the confidence with which we speak concerning the cause of this disease, and the certainty with which the subject has been investigated; we still remain dubious as to the precise circumstances under which these pestilential exhalations are generated. It was once thought that they were entirely from a marshy

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with considerable justificatⁿion; such is the influence of a powerful sunbeam continually going on in marshes, pools, and lakes; and hence we generally find aqueous prevailing in such portions of the country. Recently however, it has been maintained by Prosser, a distinguished writer on this subject, to it, neither aqueous nor vegetable respiration was the cause of marsh poison: but that "the only condition indispensable to its production is a scarcity of water, where it has recently abounded, and that it is incident to the last a very advanced stage of the disease produced." It is according to him, from the saturated, and drying margins of lakes, pools, and marshes, that it emanates, and not from the water they contain, which it is evident should be absorbed into the earth, and entirely used up by the eye before it can produce any noxious effects. The facts he adduces in support of this opinion are very conclusive; yet we have evidence on the other side sufficiently strong to demand our most serious attention; and thus rendering it hardly safe in the present state of our knowledge to come to any positive conclusion.

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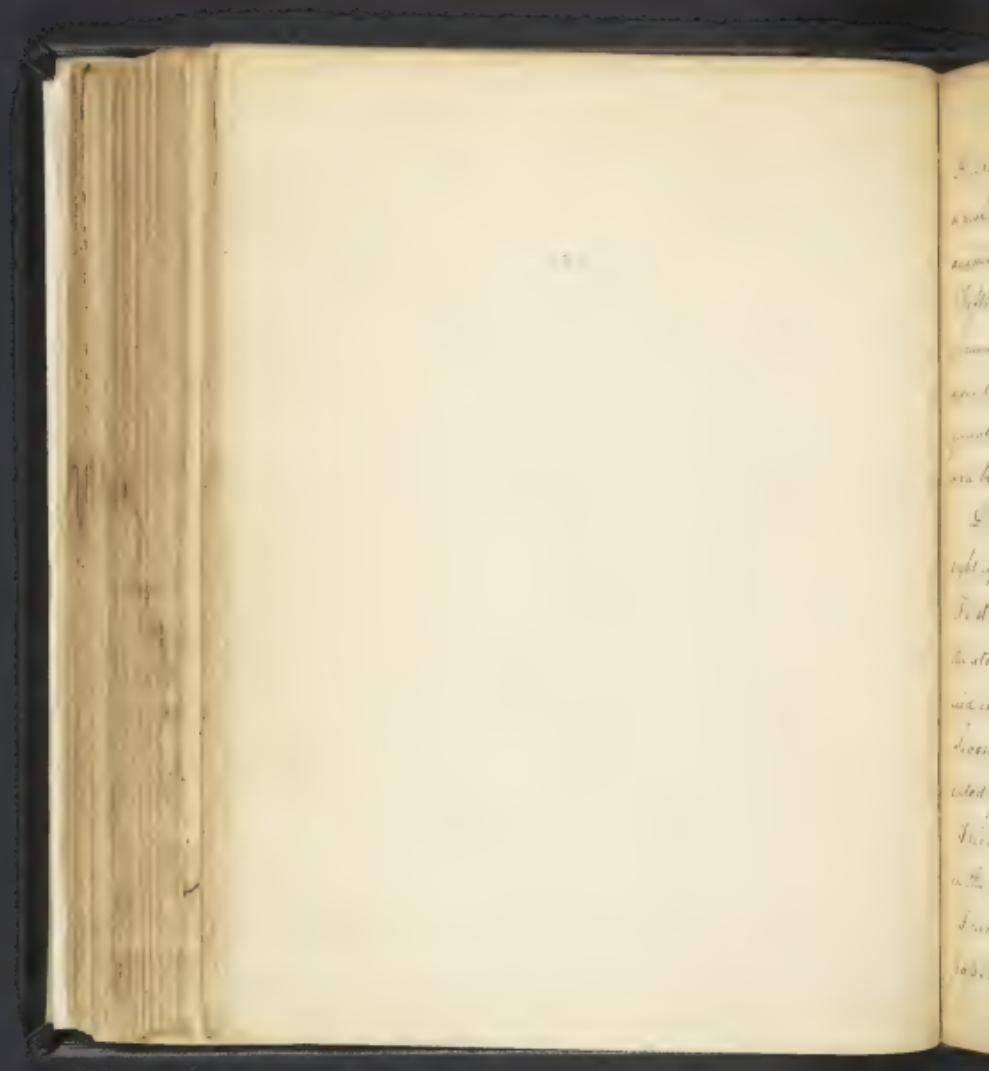
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action of these natural vapors, or to what we could attribute their poison-
ous properties. Some have said it was owing to azote, hydrogen,
or carburetted hydrogen, &c. but from experiments which were insti-
tuted for the purpose of ascertaining the cause of their deleterious qual-
ities, we are taught that it has been erroneously imputed to these air
vapors. To express our ignorance upon this subject, and to show
how little we yet know concerning their chemical nature, I will
quote the result of some experiments which have been recently repea-
ted by Professor Julia of Lyons, with much care and precision.
He concludes.

First - "That the nature of these emanations is wholly unknown -
but there is every reason to believe their deleterious effects are
owing to a portion of putrefied animal or vegetable matter, decomposed
and retained by gas?"

Second - "That the air of marshes does not differ from atmosphere
in any principle of which chemical analysis can shew the ex-
istence?"

Third - "That none of the gases disengaged from bodies in a state
of combustion, can set themselves in a sensible motion?"



Second - "That it is an error to attribute the disorders caused by marshy air to the junction between a marsh, i. carbonated hydrogen, & ammonia?" 20.

Third - "That those mists, seen in a sheep-shed, consisting only of minute particles, as easily get into the body, and you are not to be surprised therefore - a certain, and a dangerous deposit in an imperceptible quantity, through the action of mucus in, or perhaps that saline can be insinuated to them?"

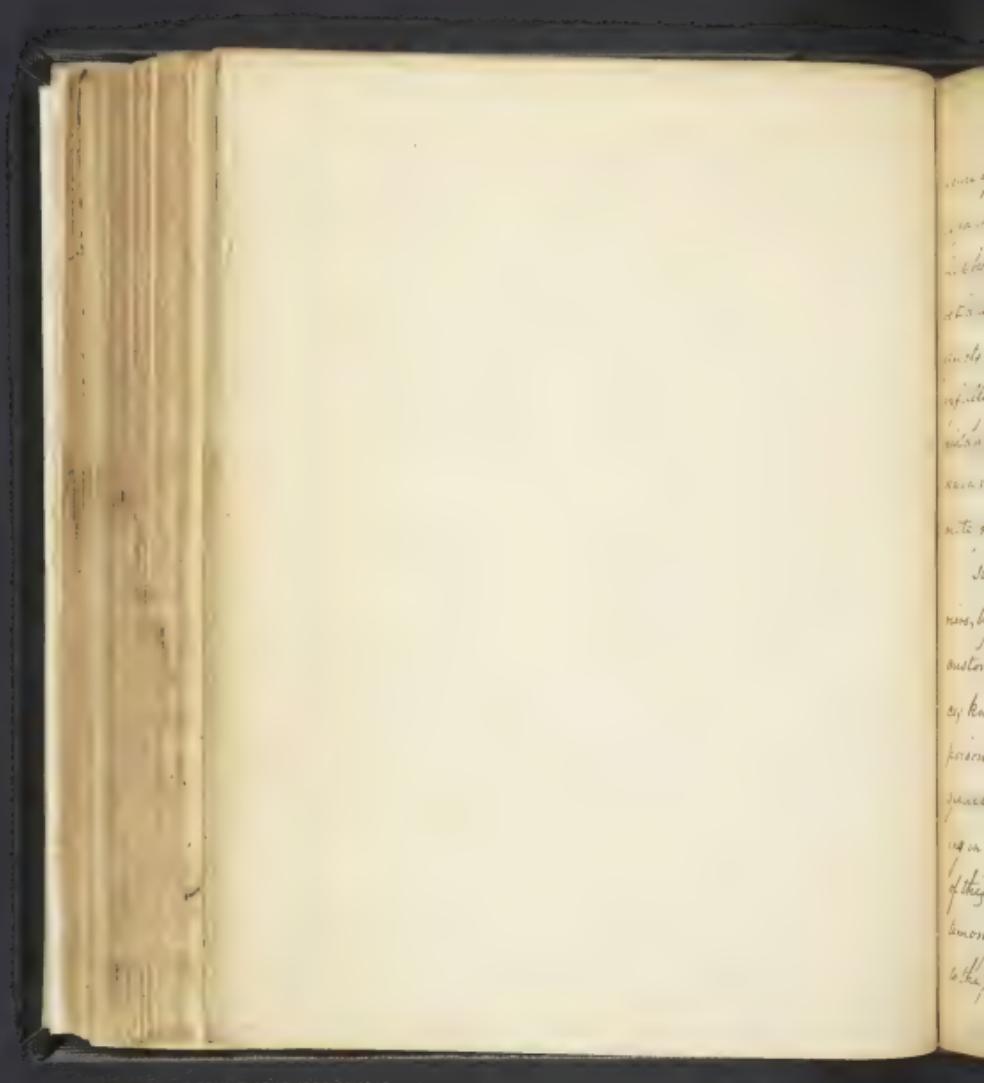
Dr. Lisle has also made experiments with a view to shed, further light upon this subject, the result of which are as follows.

First - "That mists and vapors, work gravity that they never arise in the atmosphere, unless aided by a lighter body, by which they are carried into it." 35

Second - "That they have no perceptible smell, and may be separated from odors with which they accidentally become associated."

Third - "That it is a nervous vapour which holds them suspended in the atmosphere?"

Fourth - "That various blasts from barriers which they cannot pass, and against which they are deposited?"



some of these results have been confirmed by facts long observed, as for instance we have long known that miasmata may be carried by the wind - but as relates to the distance at which they may be transmitted in such a condition as to excite their ordinary activity, much difference of sentiment prevails. We are however, in full warrant in supposing that they may be wafted to the distance of 8 or 10 miles, as we not unfrequently see diseases known to be produced by them, occur in situations thus remote from the source of exhalation.

It has likewise been known that trees, water, &c. form barriers, by which their passage is impeded, and this it has been customary to plant rows of trees between dwellings, and places known to be favourable to the production of miasmatic poison. Bancholt has observed that a vessel may lie within a quarter of a mile of the most sickly thong, without endangering in the slightest degree the health of the crew: and in support of this conclusion he has adduced the most authentic testimonies. This evidently shows that water forms an impediment to the passage of these noxious vapours, which it does proba-
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to be absorbing them when ill-nature is service.

It is in the effort of nature to be in generating, intermittent fever, that in this disease, which is not conducive to topographical, as fatigue, mental ruminations, meagre diet, excessive evacuations; also cold, especially from, joined with moisture, as wet clothes, exposure to rain, &c., to rooms, beds, &c., - but these are to be considered rather as exciting than remote causes. Some have likewise it to be communicated by contagion, but this is by no means consistent with general observation.

After dwelling thus long on the nature and cause of intermissions, I shall proceed to lay down the treatment; and in doing this, I will merely give a summary of what seems at present to be most generally effectual.

The treatment naturally divides itself into two distinct parts; that during the paroxysm, and that during the interval or aphonya.

In the treatment of a paroxysm we are to imitate nature; differing from her only, by hastening, if possible, her progress. During the cold stage, it is our duty to endeavour to induce

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the hot; and when the hot stage comes on, to consist by proper means the secretion by the skin; or in other words, it is our whole object during the first stage to induce perspiration which lessens the heat.

On the first approach to the first paroxysm, we put the patient immediately into a warm ^{bed} and apply topical applications, as bottles filled with warm water, hot bricks, &c. to his abdomen and extremities; and assist their diaphoretic effects by warm dilute drams, such as the herb tea, and if necessary even by wine when the cold stage is very violent, and dangerous consequences seem likely to follow, the best remedy is an emetic, which not unfrequently affords relief during its operation. Being however, always an unpleasant remedy, it should not be prescribed but in particular cases.

The application of tourniquets to the limbs have been very strongly recommended by Mr. Kellie with a view to check the cold fit of ague. From the observations which he made he deduces the following conclusions. First - that at any time during the cold fit of an intermittent, if tourniquets be so applied as to obstruct the circulation in two of the extremities,

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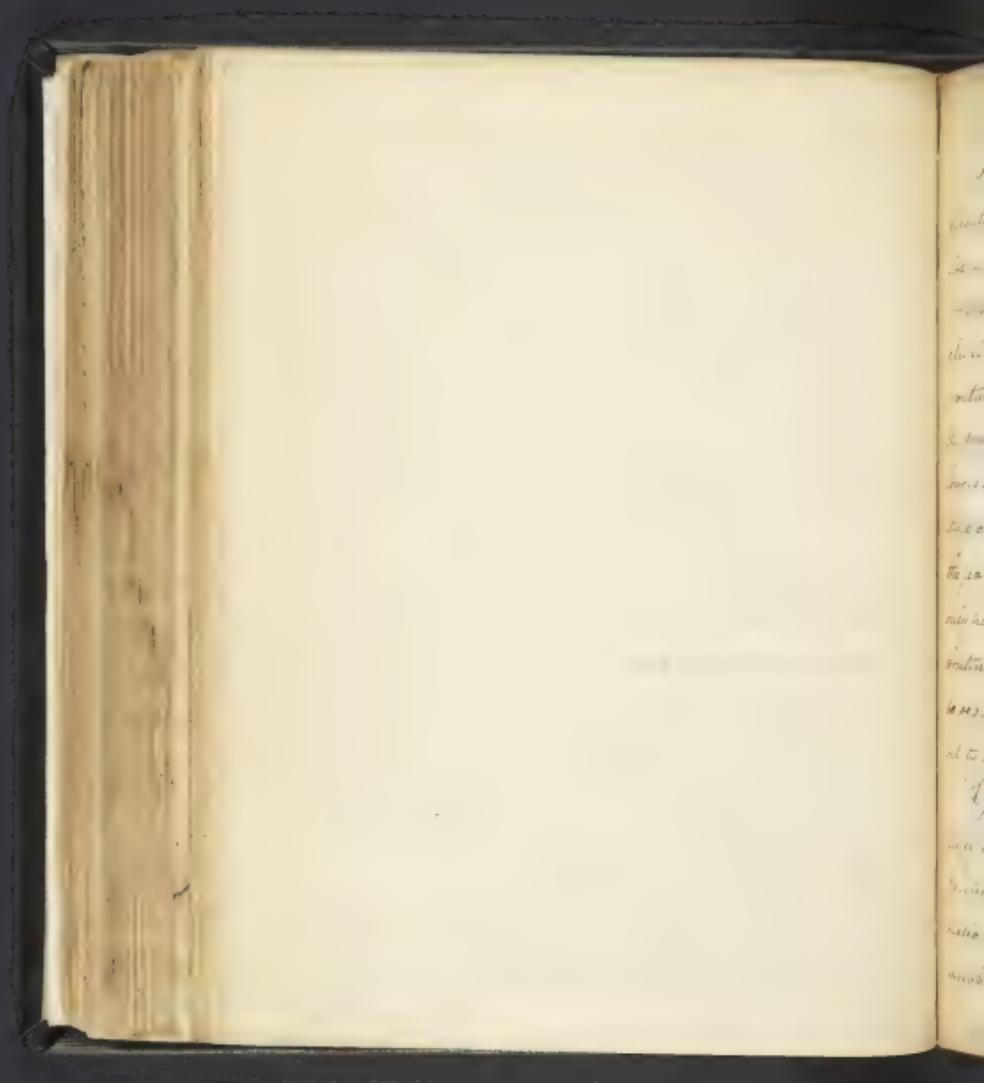
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in three minutes; thereafter the hot stage will be induced. Second, that if the tonics quietly be applied previous to the accession of the paroxysm, the cold stage will be entirely prevented. Third, that when the cold stage of an ague is either thus shortened or prevented, the following hot stage is rendered both milder and shorter. Whether this is of any positive advantage in arresting the cold fit, I will not attempt at present to decide, but Professor Chapman says he has seen it tried in the hospitals at Edinburgh, without any benefit whatever.

Opium is a remedy much employed in the cold fit, and was originally introduced by Dr. Trotter, who gave it in the form of laudanum, gr. xxx. of which was generally sufficient to arrest the paroxysm. This practice is sanctioned by the most experienced practitioners: sometimes however, it may be necessary to give it in much larger doses, than that recommended by Dr. Trotter.

If death takes place in the cold stage, which is rarely the case, it is owing to congestion, or an unusual accumulation of blood in the internal parts.



The treatment now is. For nocturnal & non-concipated ticks, until the o. d. & st. are eliminated, we must content in the meanwhile to remove the worms and to see what can be done to neutralize & quiet the intestinal irritation. The proper mode of accomplishing the former object, however, & this is the cause of much irritation, is the exhibition of an emetic, which neutralizes the stomach, its action on the intestines, it also gives to the patient a quietness, & removes its tenacious, uncooperative quality, so as to facilitate the coming on of a diarrhoea, an emetic will do this, & nothing comes on, & continues, nothing more is required than to give the patient freely of warm beverages, as warm teas, wine, &c., which only has the effect of facilitating the evacuation. Spitting should continue after sufficient evacuation have been induced, it may be necessary to give a little ipecacuanha or opium to calm the irritation of the stomach.

To fulfil the second indication in the hot fit, we depend principally on those medicines which promote perspiration; and for that purpose most practitioners of this country employ the Tartar & nitre in small doses; while the European physicians are very much in the habit of using the James powder, an article known

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to resemble very much in its composition and diaphoretic virtue the pulv. or Antimonials of the dispensatory. Beside these we have other articles which seem to possess very excellent powers in promoting diaphoresis, as the *Eupatorium Profoliatum*, and *Asclepias Minutissima*. The former of these is a native plant growing in meadows and low grounds, well known to the country people by the title of Brough root, Indian sage, and especially Bore root. With a view of obtaining its diaphoretic effects, it is given in a warm infusion. The *Asclepias Minutissima* is also a medicine well suited to the hot stage of enteric fevers, acting not only with promptness and efficacy, but is retained on the stomach when others are rejected, and in this account is often resorted to with very much advantage.

Opium has been strenuously recommended in the hot fit by the practitioners of warm climates, and particularly by Dr. Lind, who after ample experience with it declares, that it "speedily excites diaphoresis, hastens the solution of the paroxysm, and is the best opiate for the alleviation of the heat. And says, those cases which he treated in this way were never followed by jaundice,

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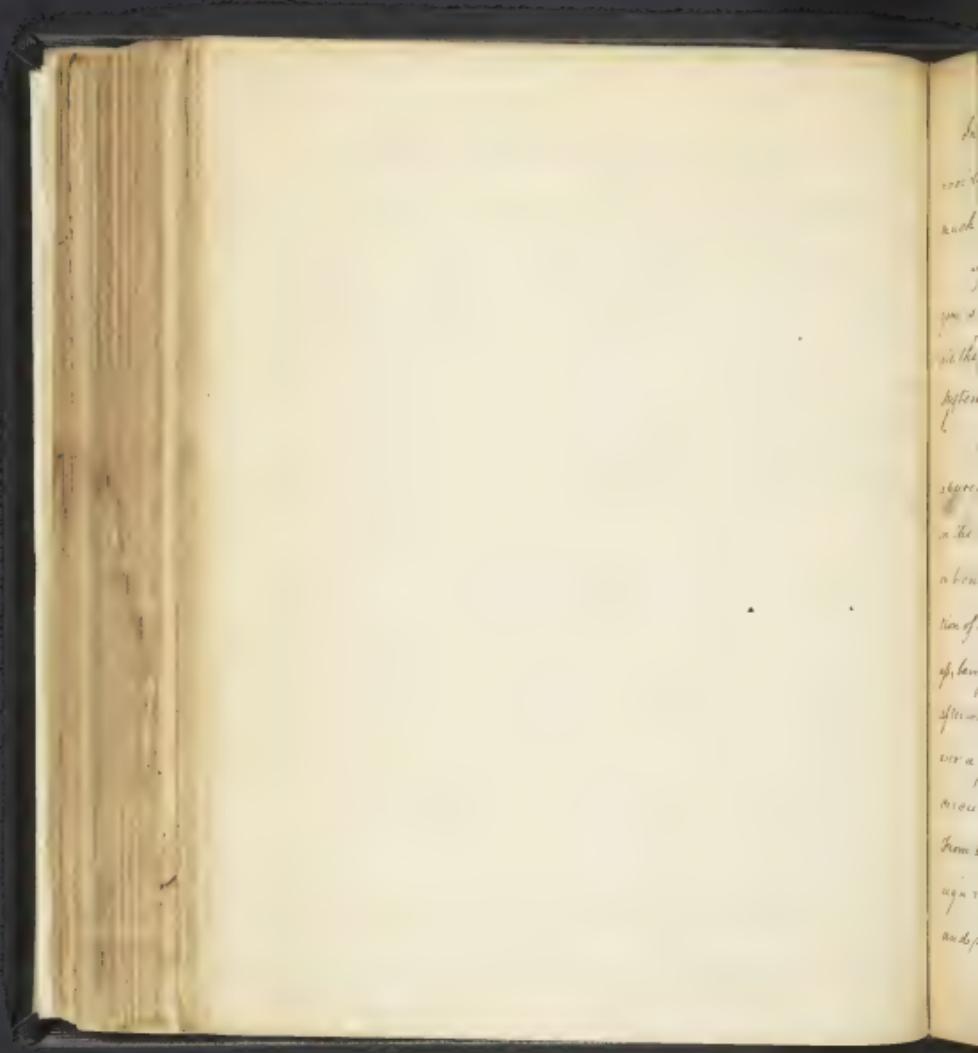
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distesy, &c. Sometime elapsed before the practitioners of this country could consent to follow the practice of Dr Lind, but after trying the remedy faithfully, they found it was well suited to those cases where no inflammatory symptoms existed; and prescribed under such circumstances, it is now generally admitted to be extremely useful.

Before concluding my observations on the treatment of the hot stage, I must point out briefly, the plan to be pursued when the disease partakes of a more inflammatory type, which is more apt to be the case in the spring of the year, owing in all probability to the weather being cooler and more changeable, under which circumstances, the inflammatory diathesis is known to prevail. In cases of this nature when there is pain in the head, a flushed countenance, obstinate delirium or dyspnoea, with a strong, full and hard pulse, the lancet is to be employed, the alimentary canal to be excreted, by emetics or mercurial purges; and afterwards we may use with great advantage some mild diaphoretic, or the Spiritus Menderori, or antimonial wine in combination with the former, & with a filer.



In the so-called stage we have but little to attend to, but avoid whatever has a tendency to check the discharge, and if much debility ^{be} present, to administer some gentle cordial.

If an intermittent assume the typhus character, the proper remedy is to be treated by cordials, stimulating diaaphoretics, and all the means which tend to support and improve the tone of the system.

I am, next to speak of the treatment during the intermission or absovia. And among all the remedies which have been tried in the cure of intermissions, none has received half the encumbrance, or been so universally commended as the Peruvian bark. The attention of the Europeans was first drawn to it by Cinchon, the Spanish count of, being cured of an obstinate intermittent by it in 1648: and afterwards a quantity of it was introduced into Italy and distributed over a great part of Europe at a high price by the Jesuits, from which circumstance it acquired the name of jesuits bark, (pulvis jesu) From this time it came into general use, and was esteemed as a sovereign remedy for this disease; but by some means it fell into discredit, and many years elapsed before it was restored by Talbot; since which, it

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it has preserved an univailed reputation, amidst the many and diversified opinions which have been entertained concerning it.

As to the proper time at which this remedy ought to be administered, not a little difference of sentiment has prevailed. It was contended, by some, that the bark should not be given until the fever had run through several paroxysms, so that no oblique influence, might be expell'd: and among those who supported this absurd doctrine, were Boerhaave and Sydenham. At the present day physicians are too well acquainted with the nature of this disease, not to interfere as soon as possible, and endeavor to intercept its progress, well knowing that delay only tends to irritate more firmly on the system. They apply the bark immediately, waiting only to evacuate the stomach and bowels, and to subdue inflammatory symptoms if present, by venae section. Indeed, many practice the bark without even promising evacuations; and such a course is not entirely destitute of success—but the prevalent opinion of practitioners is, that the alimentary canal should first be evacuated by emetics or purgatives, or if necessary by both; and for this purpose tartar emetic and calomel are generally used.

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Of late the preference has been given to purgatives, but there are manuscripts, in which emetics are indispensable. They act not only as mere evacuants, but also operate by making a powerful impression on the stomach, which has the effect of breaking down the train of morbid association, on which depends the regular return of this periodical disease. It is from this mode of action, that active vomiting soon following is so especially successful in the cure of intermitents, and especially those of long standing.

It has been the custom of some practitioners to withhold the use of the bark until just before the commencement of the anticipated paroxysm. Dr. Willson was of this opinion, and there appears to be some ground for such belief; for this contended that the bark was then given so as to make the greatest impression on the stomach at the very point of time when the fit was about to occur. And this is further supported by the fact, that balsam given just before the return of the paroxysm acts with greater certainty, than when given a long previous to its return, so that the impression may be worn off. To this we can reply, that opium being a diffusible stimulant, operates much more speedily than bark, and hence a paroxysm

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greater length of time is demanded between the administration of the latter, and the time at which its highest degree of action is exerted.

Some writers on the subject have pursued even further than Cullen, and affirmed that the bark should be given during the whole exacerbation; this certainly is erroneous; the bark never fails to aggravate the disease if given while the febrile symptoms are present: and Professor Chapman tells us, that he always found it injurious even when prescribed near the accission of the fit.

Robert on the other hand, insists, that the proper time for the administration of the bark is at the most remote period possible from the commencement of the next expected paroxysm. His practice therefore was to exhibit it in large and frequent doses in the commencement of the apoplectic, instead of the fits; and according to his own account was signally successful.

Bark has been condemned on account of its being supposed to induce visceral obstructions, which, not unfrequently accompany intermittent fever. But the ablist practitioners do not hesitate to employ the bark even where such obstructions

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tions exist, provided they are not attended with inflammatory action. This appears to be the point to which our attention should be solely directed; and where we do not find the inflammatory deather is connected with such cases, we may with the greatest safety and advantage prescribe the bark. But on the contrary, where there is pain in the side, an active pulse, and other symptoms indicating inflammation, the bark is to be avoided as highly pernicious; while the lancet, if called for by the activity of the pulse, and violence of the pain, is to be employed. Blisters and a slight salivation, however, are generally sufficient to remove these obstructions.

It is a most unwise course to let the bark remain in the system, as it is a common cause of a tertian, and other intermitting convulsions; but this is a mere maxim. Should it be necessary to use it in consequence of the bark not having been given in time, or neglecting, and subduing, or cutting, or to effect a complete cure - just as insuspirable blood-blisters, in Rheumatism, will cure a violent griping in the side; and it is in this way that sensible persons have often, from their reputation, been exposed to contempt.

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that is administered them.

As to the other medicaments which are given in the above Diseases to be the principal, nothing, but it is not necessary that they should be in a more violent substance; as when the vapours return to the volatile, many cannot take it in this way, and then heating, necessary to have no use to serve the purpose. It may be, in some Diseases, infusion and decoction; and to make it more agreeable some, as mustard, a mustard, orange peal, cinnamon, carduus, &c. Such not expensively roots & fern being rejected, when they are it cannot be too much. In cases of extreme irritability of the Stomach, it has been advised to give it in the form of oysters, and for this purpose it is entangled with some mussels.

In the winter time of a little broad beans. Caluplasms of bark, also, the root, madder, &c. &c. is incisively, and what so called the black arachet, have all been recommended, and the latter, and useful in the case of diarrhoea, yet these are more generally thought to be too feeble now days.

In the bark should suffice castor oil, which is sometimes the case, & two grains of rhubarb, may be added to each dose; & if short

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and on a few drops of lime-saline with have the effect of preventing
and soon removing the stool. Milk and liquorice are the best
articles to disgorge the load of the bark.

It has been recently ascertained that the bark contains an
alkaline base, in which its active virtues reside. That obtained
from the yellow bark has the name of quinine, that from the pale, cin-
chonine, and both of these are found in the red.

When sulphuric acid is added to the base called quinine it
forms a neutral salt, which in the dose of about $\frac{1}{2}$ dr. repeated as cir-
casson may require, is very effectual in the cure of intermissions.
It is given during the apyrexia in the form of pills, or powder in
cinnamon water, to which a few drops of sulphuric acid may
be added, to render the solution more complete. This is liable
to be a valuable preparation, having all the virtues of the bark, and
the dose being small, it will be retained on the stomach, and not
interfere with other remedial articles. But
I regret that it has been the misfortune of this article, like many
others to be a adulterated, which might be expected from the very high
price at which it is vended.

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In returning this article, there is a residue of a thick, brown, viscid substance, that after a short time becomes solid, and assumes a resinous appearance. This article during the present season has been much employed in the city and neighbourhood of Philadelphia in the cure of ague, and appears to be no less efficacious than the sulphate of quinine. One or two grains may be given with the former pill every hour or two hours during the interval until forty gr. xx. are taken, which is generally sufficient to arrest the tert.

From what has been now said of the Peruvian bark in the cure of this disease, I need only observe, that ought will occur in which it will fail after being tried in every form; but where the system is properly prepared for it, and we are careful to abhilit during a complete intermission, we shall frequently be gratified at witnessing a speedy cure.

The *Cornus Florida*, or Dogwood has been ably investigated by Dr. Walker of Virginia; and on analysis appears to present results similar to those of the Peruvian bark. It is a tonic of very considerable efficacy, and from the charts of those who have

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have tried it in this disease, we may safely conclude that its employment in the treatment of ague, is attended with frequent success. It is thought to be rather more stimulating than the Peruvian bark, but there is a very great resemblance in their effects on the system, when given in the same way and in similar doses.

The bark of the *Prunus Virginiana*, a wild cherry-tree is esteemed as an useful article, and probably its virtues may be especially active in the cure of intermittents, but I would rather employ it in other diseases, to which I think it better suited. It is exhibited in the form of substance, tincture, decoction and infusion, in doses rather larger than the Peruvian bark.

... different species of oak have been recommended, and may occasionally be service. All I have seen tell little however, and on such a subject, and for want of experience I can say nothing of their supposed virtues.

The *Angustura* bark, given in smaller doses than the Peruvian, is less apt to disorder the stomach and bowels, and has been known to succeed in cases where the latter had failed. It is slightly aromatic and astringent, and is well adopted to those cases

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of irritable stomach and bowels, when it would be impracticable to prescribe the cinchona.

Besides the different kinds of bark which I have mentioned, there are several others, which I shall sususpect, particularly ^{of} some of them are indigenous, and may be resorted to in cases of emergency. These are the *Rinos berberilla*, *Liriodendron Tulipifera*, *Swietenia Tabifluga*, *Cinchona calicea*, *Cinchona Samarensis*, and almost every species of the willow, (Salix.)

As to the real value of many of these, I have nothing to say, but they have all been recommended, and some of them by such authorities, that we can not hesitate to believe they are endowed with anti-intermittent powers. From the experiments which Dr. Rogers made with the *Liriodendron Tulipifera*, we are taught that it is a powerful stimulant, and useful tonic. Dr. Rush and Dr. Barton thought it displayed very valuable powers, when given for the cure of ague. Profess. Chapman says every species of the willow is endowed with tonic virtues; and the experiments which he instituted in the Mass-house convinced him that the common willow was decidedly useful in this disease.

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Among the many vegetables which our own country furnishes for the cure of ague, is the *Aristolochia serpentaria*, or virginian snake root. This is said to be next to the *peruviana* bark in point of efficacy, and is much employed in combination with this article; very often accomplishing cures where the bark alone has failed. It is an agreeable aromatic, and pleasant tonic, seldom offends the stomach, and for this reason, may be given in all cases where irritability of the ague accompanying the disease. It is a matter of some doubt whether this article is really competent by itself to cure intermittent; but when given in combination with other articles, its powers are highly acknowledged. Sydenham gave it conjoined with wine, in order to prevent the recurrence of the paroxysm, and not without success. The following formula is in great repute among the practitioners of this country.

R. Cort. Peruv. - 3ff.

Rad. Serpent. - 3j.

Soda carb. sub Potassa carb. p. 1lb. m. diss. in ruborice
all of which are to be taken in the course of the day. This, although

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I have never seen it used, is I have no doubt a salutary prescription, and most practitioners are prepared to bear testimony of its power in arresting some of the most intractable cases of our frequent epidemic.

The next article is the *Eupatorium Perfoliatum*. This I have already spoken of in the treatment during the paroxysm—but it is an article capable of fulfilling different indications according to the manner of its exhibition. Thus, in the paroxysm we give it in warm decoction or infusion, for the purpose of exciting diaphoresis; but in the interval, where it is less efficacious, in order to procure its tonic power, we employ it in powder, or cold decoction.

The *Eupatorium Succifolium*, a plant growing in most of the middle states, is used with advantage, though it is less powerful than the preceding species.

The *Sabbatia Angulata* ~~or~~ ^{gentian} is also used as a tonic in this disease, and is thought not inferior to the *achimia centaurium* of Europe. It has like some other articles, the advantage over Peruvian bark of being admissible in every stage of the disease.

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Most bitters have been found more or less useful as a substitute for the bark, and may occasionally be employed in mild cases with benefit. Those mostly preferred are Zia pia and Eulumba in decoction or infusion.

A variety of astringents have been employed, some of which are highly useful. Those most frequently prescribed, are Gambino, Gum, Galls, and Sassafras. The first of these which is the kino, and which is thought the most effectual, was first made use of by Dr. S. Thegill in intermitents, and found to be successful after the bark had failed. Professor Chapman considers it a useful article in the following formula.

12*gr* Gum Kino 3*ij*

Rad. Gent. 3*js*.

Gum opic. *gij m. diu in hunc xij. m.*
to be taken every two hours during the interval.

It is but a short time since charcoal has been very strongly recommended by Dr. Calvert, and from the experience of many able practitioners of the city of Philadelphia we are led to conclude its powers are not slender in curing intermit-

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tent, and especially those attended with dysentery. It is in this latter case that the charcoal has been signally useful in the Whit adolphus Alms-houze. The dose is $\frac{3}{4}$ repeated every hour or two hours during the intermission.

Sulphur is a remedy of some efficacy in intermissions, and is now much employed by the poor. It is given in the dose of about $\frac{3}{4}$.

The Sulphate of Copper, or Blue vitriol has been found to arrest some obstinate cases of ague. Dr. Monroe gave it according to the following formula. No. Sulph. Cupri. gr. vii.

Ext. of Cinchon. gr. xxxij. m. dñ
a pilule. xij. one to be taken every three or four hours.

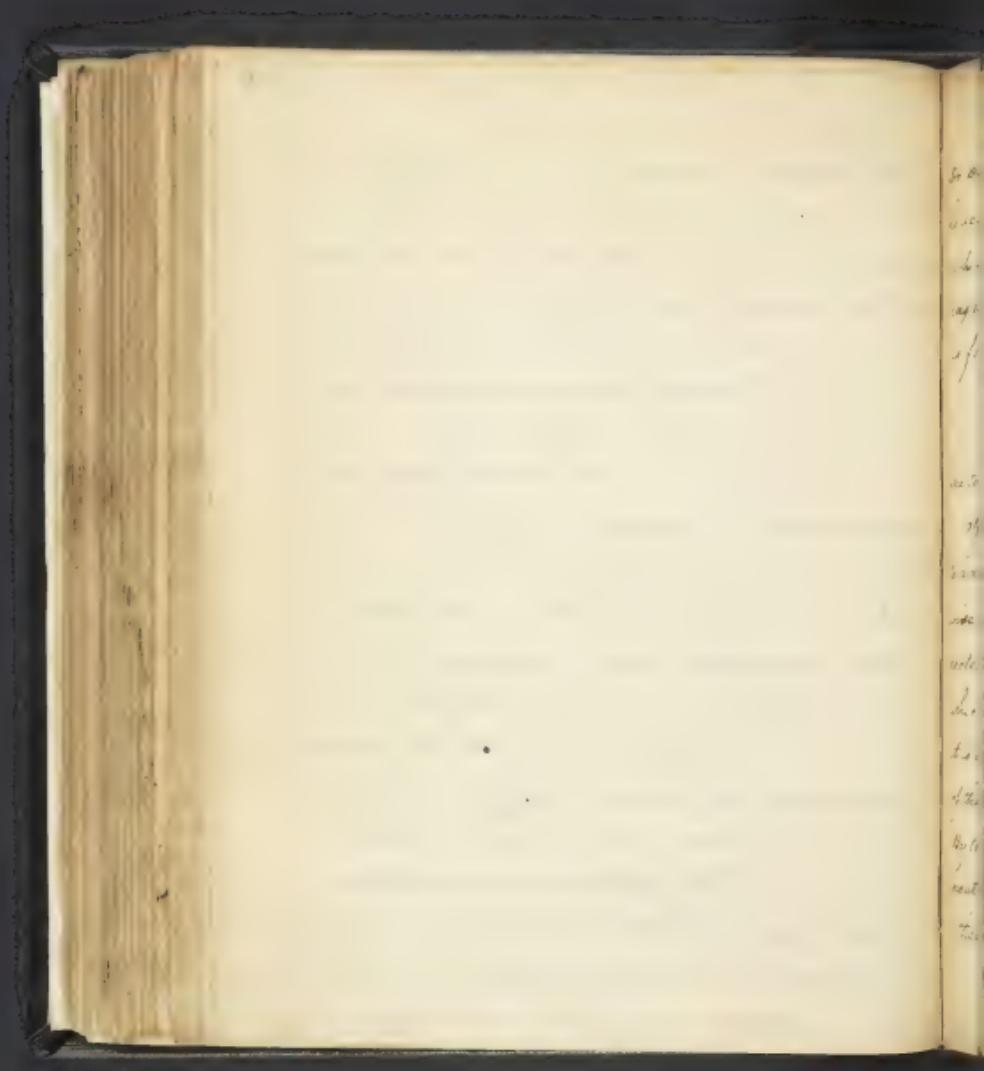
The Balsiate of Iron has recently been much spoken of by Dr. Tollick of Maryland, as a remedy in this disease; and from the highly respectable character of this gentleman, we are induced to suppose his reports are not altogether unfounded. The dose is from 4 to 8 grains given twice or thrice a day, without any regard to the paroxysm.

Arsenic like most active medicines has been em-
ployed



ployed in the cure of intermitents: and in this employment it has its advocates who have extolled it highly, while others have condemned it not only as a useless, but even a dangerous remedy. That it is an article productive of mischief when injudiciously employed, no one will pretend to deny; for it may be set down as a maxim, that any medicine which will not do mischief, when improperly exhibited, is very little worth. But as one when properly administered, is as safe, and equal, if not superior to all other remedies in arresting the course of intermitents.

I have seen it employed, more than any other article, and with such success, that I have become exceedingly attached to it in the cure of this disease. It is the practice of most physicians who prescribe it, to employ it in the form of Foxwells Solution, a preparation which I consider very inefficient for this purpose, although it is occasionally productive of advantage. The best mode of exhibiting this active and powerful medicine is in the form of pills, in the dose of about $\frac{1}{2}$ a $\frac{1}{2}$ of a grain of the white oxide three times a day. My worthy preceptor Dr.



Dr. Darlington is in the habit of using the following prescription, which he received from the late Dr. Vaughan of Wilmington, cont. with such success that during the course of his forty years practice he has never met a single case in which it failed. The formula is as follows.

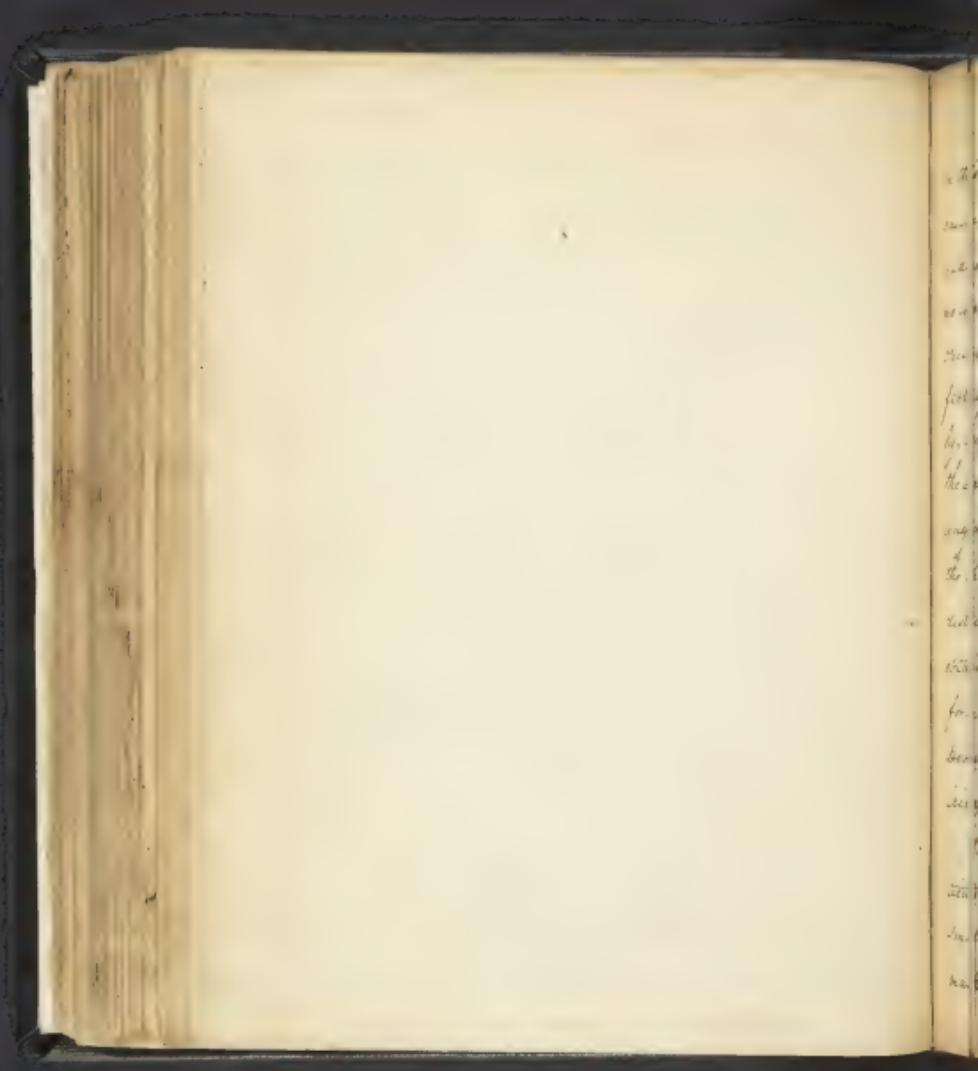
R. Sal Ammon. ff.

Gram. Opii - gr. xij.

White oxide of arsen. gr. xij. m. ft. pilul. Zxii.
one to be given three times a day to an adult.

If the patient complain of sickness at stomach, it will be proper to administer an emetic previous to taking the arsenic, otherwise, no preparatory treatment is necessary. The pills as above directed are to be continued until the paroxysms are suspended, which is generally the case on the second or third day; after which it is requisite to administer bark for a few days that the tone of the system may be improved, and a recurrence prevented. By this treatment the paroxysms are more quickly and permanently subdued, than when treated by the bark alone, or any other remedy with which I am acquainted.

It may be proper to remark that by employing the arsenic in



in this way, there is no reason to apprehend any injury from it. occasionally there is a slight swelling of some part of the body, as the ankles and feet; but even this rarely occurs, and when it does, is no inconvenience to the patient, and quickly subsides. Whether Sulphur, as it is said, has the power of obviating its injurious effects spoken of by authors, I will not attempt to decide positively, but I am inclined to think it highly probable that such is the case. Neither am I aware that the sal ammoniac is in any way serviceable, further, than by using it as an ingredient, the Sulphur is more completely reduced to powder, and an equal distribution of the arsenic through the mass is more effectually obtained, which is operationally important. Indeed the foregoing formula seems to be, as Dr. Chapman has remarked of the Soveray Powder, one of those lucky hits in the combination of medicines, which cannot be improved.

By proportioning the dose according to the patient of any age; and on account of the dose being extremely small, and capable of concealment in any substance; it is remarkable well suited to children, who cannot be prevailed upon

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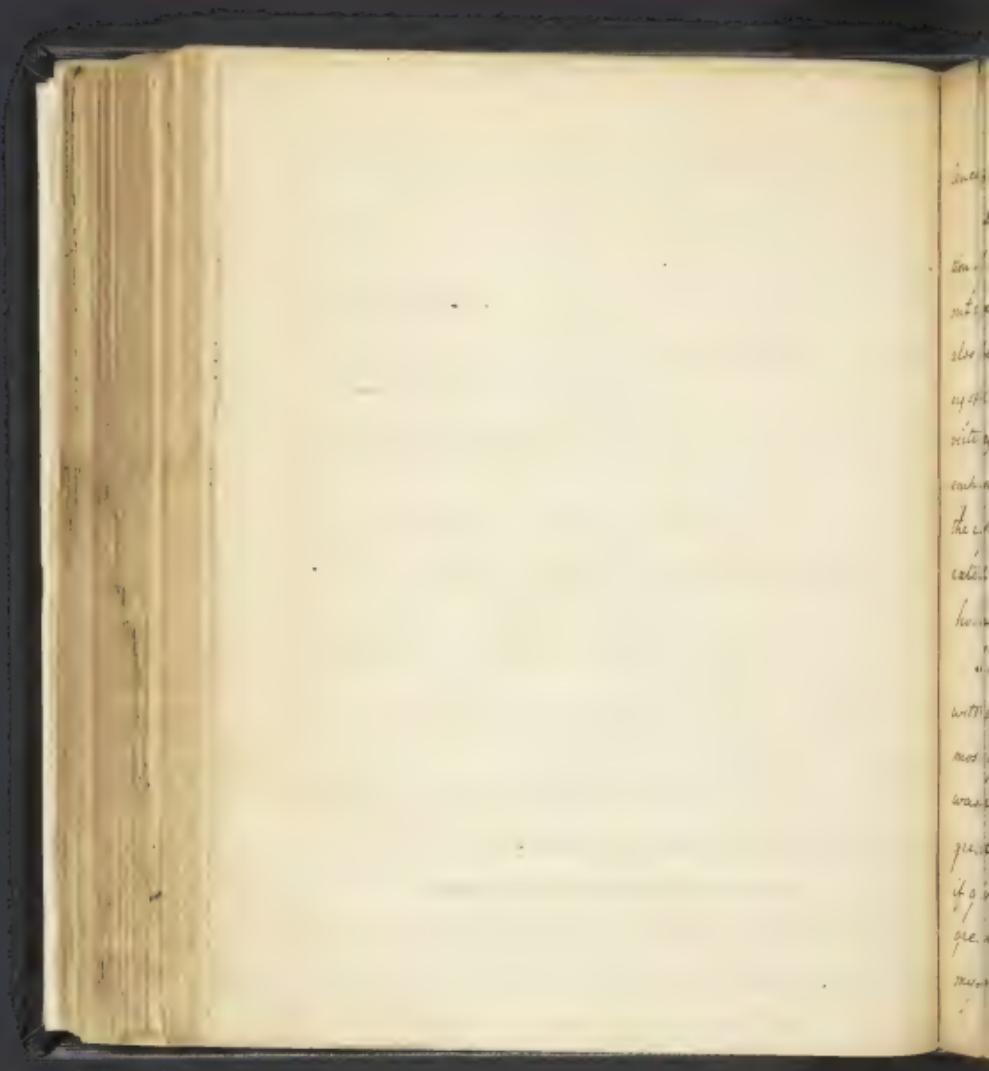
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upon to take the bark in sufficient quantity to arrest the disease.

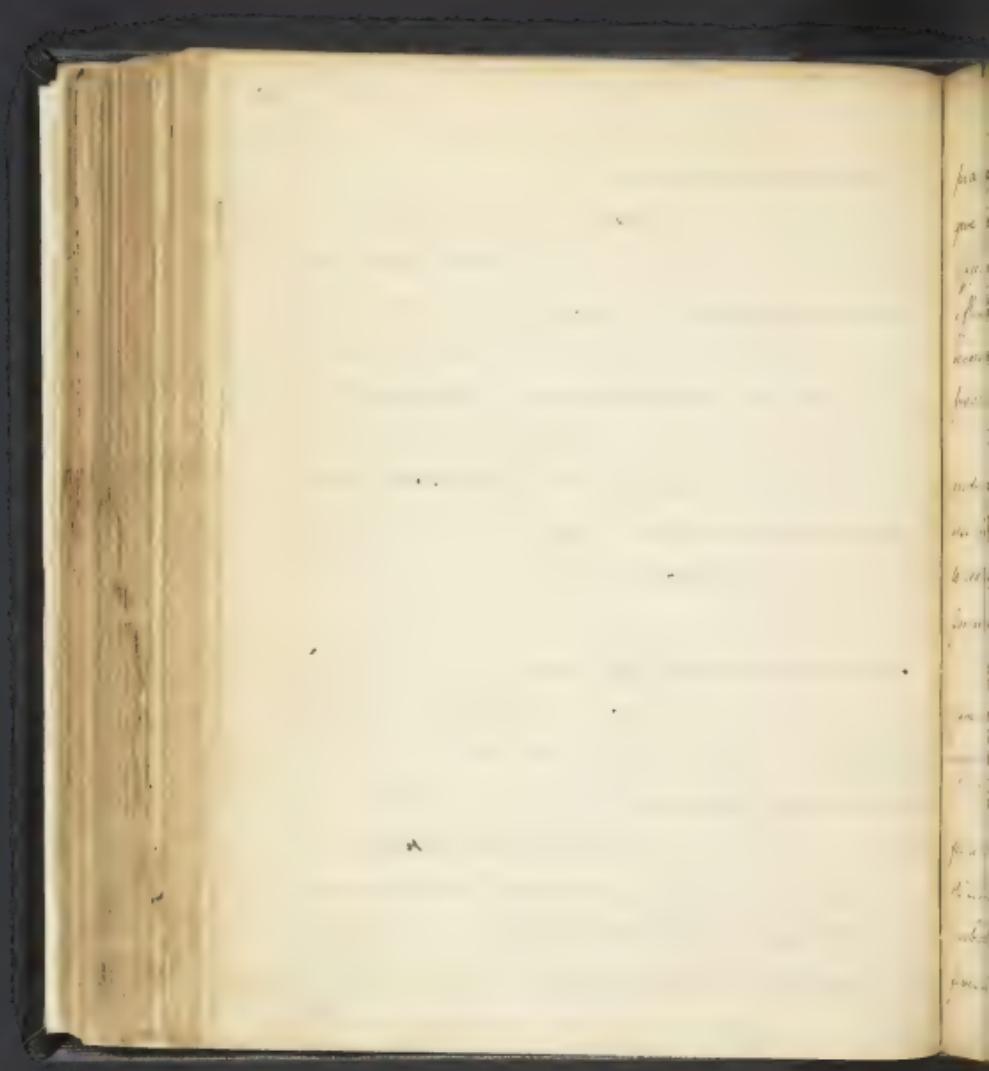
Vela Aranei. The web of the black spider, which inhabits cellars, barns, and stables, is recommended by the cure of ague by several authors, and particularly by Dr. R. Jackson of the British army. He thinks it more effectual in preventing the recurrence of the febrile paroxysms, than either bark, or ~~aconic~~
or any other remedy employed for that purpose. He further says that if the cobweb was given to a patient prepared by bleeding, emetics, or purgatives, it seldom failed to effect a cure comparatively permanent; and it was a rare occurrence for the disease thus suspended to relapse into another form. If given in the time of perfect intermission in the return of the paroxysm was prevented; if given under the first symptoms of a commencing paroxysm, the symptoms were subside'd, and the course of the paroxysm was so much interrupted, that the disease for its most part lost its characteristic symptoms. If given after the paroxysm had advanced, if prolix, the symptoms of irritation, viz. tremors, startings, spasms, and delirium - if such existed as forms of febrile action, were usually reduced in violence.



lence, sometimes entirely removed."

Dr. Jackson is high authority; and from his representation of the article we are induced to believe that it is not without valuable powers in the treatment of intermittent. It has also been tried by several of the most distinguished practitioners of Philadelphia, and ascertained to robes very active virtues, particularly in the cure of this disease, where they have employed it with such success, as to be perfectly satisfied that the merits of Dr. Jackson are but very little if at all exaggerated. The dose is 4 or 5 grains repeated every fourth or fifth hour.

I come now to speak of those articles which are employed with a view of obviating the recurrence of a paroxysm; and most of these I have already mentioned. I have said opium was recommended in the cold fit, and used with very great advantage: I may here observe that it is less useful if given just before the commencement of it, so as to make the greatest impression on the system at the very time when the paroxysm was expected. Dr. Trotter speaks in high terms of this



practice, which, according to his account, never failed to give relief. It produces an exhalation of spirits, with a wish rather than a desire to be alone, a cheerful countenance, no flushed cheeks. The pulse which ^{is} weak and sometimes irregular, becomes less frequent, full, and equal, in a sensible warmth diffused over the whole frame, and every unpleasant feeling banished.

Emetics have also long ^{been} in use just before the reception of the fit, and have sufficient evidence of their signal utility in such cases. They produce a powerful impression on the stomach, which tends to clear the surface, and excite diaphoresis, as mentioned on a former occasion.

Blisters have been said to prevent the recurrence of the huan ^{when} applied so long before its reception, as to make the greatest impression at the time of the anticipated attack.

Solphorus Althea given in the dose of about a drachm has been found useful when prescribed under the same circumstances as opium. It is a powerful and diffusible stimulant, and in addition to its ^{powerful} impressionizing the cold stage of fits, induces very strong impressions to be written in the mind a body.



body seem to have the effect of preventing a recurrence of a paroxysm of this disease. Those which are known to act sufficiently powerful on the former to subvert the fit, are horror, superstition, &c.

After the aforesaid remedies have failed, necessity may be tried, and to prove useful it is necessary to induce a slight salivation, which should be kept up for several weeks.

After ^{the} employment of all these remedies which I have enumerated, and many others which might be added, it will occasionally be the misfortune of those engaged in the practice of their profession to witness cases which remain intractable, and will in spite of all our efforts degenerate into diseases of a more serious character. Intermittents change into continued fevers, and sometimes assume a typhus form; but they generally degenerate into obstructions of the abdominal viscera, and their ordinary consequences, as jaundice and dyspepsy. And it is from these circumstances, that we are taught their injurious nature, although much has been said of their salutary influence. The doctrine of Moorhaave was no less dangerous than erroneous; for many acquiescing in this opinion were induced to refrain from applying

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plying their remedies in the early stage of the disease, which only had the effect of strengthening the morbid habit, and implanting the disease or its attendants so firmly in the system, that to attempt their removal, was only to expose the inefficacy of our art.

In concluding what I have to say on intermittents, I need only add, that those who wish to be successful in exterminating the morbid association upon which the existence of this disease depends, must attack it in the very onset, and with such remedies as are calculated to make a powerful impression on the system, and in almost every case we shall be gratified at seeing our patient convalescent, and our conduct applauded.

Finis.

